APPENDIX B

Nested Line Intercept Sampling Protocol for Riparian Vegetation

Paul Cereghino, NOAA Restoration Center

B.1 Monitoring Objectives

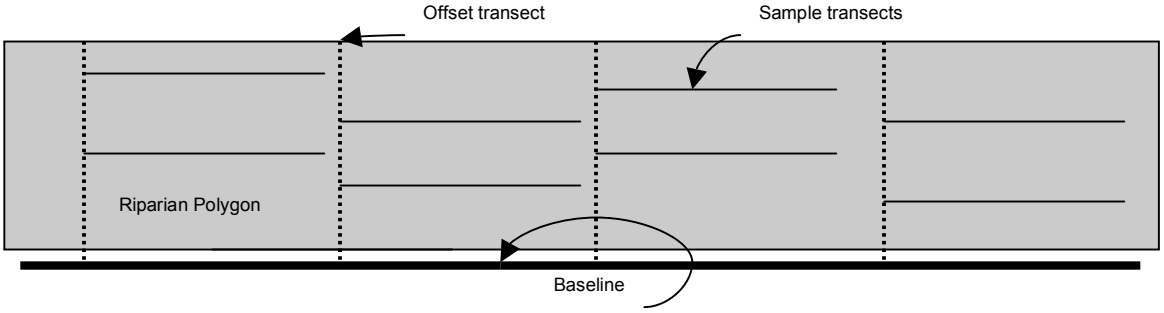
- Produce statistically robust population mean and variance estimates for cover of specified woody and ground vegetation layer taxa within a riparian zone.
- Detect change in mean cover between this sample and a future sample following management activity.
- Reduce potential for observer bias and reduce between sample variation to minimize confidence interval.

B.2 Tools Required

- Stakes for marking offset transects
- Data sheets
- (3) 50 Meter Tapes
- Random number table for placing transects and quadrats
- 0.5 x 2 m Quadrat for ground vegetation cover estimates

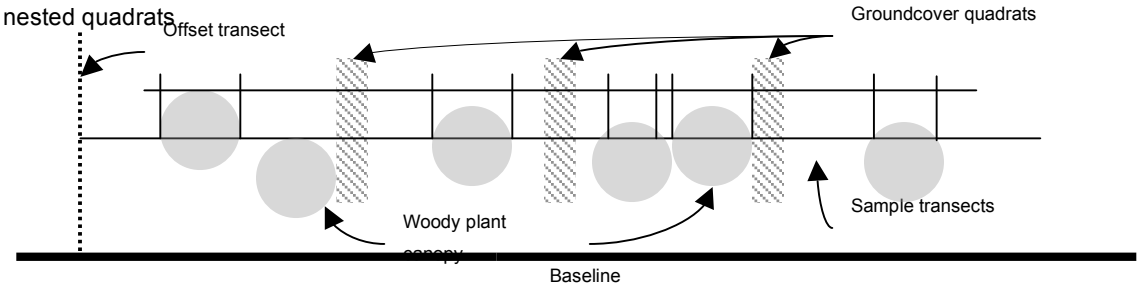
This sampling strategy aims to provide an efficient estimate of relative species dominance and canopy structure using a modified line-intercept technique. All sites described have a long narrow riparian buffer strip. Transects will be offset a random distance from a baseline located along the long side of the riparian buffer (Figure B-1). Each transect will be parallel to the baseline. The beginning, middle, and end of each offset transect will be permanently marked. No more than 25 transects will be completed per site. Transect length will not exceed 20 meters.

Figure B-1 – Transect Placement Diagram – The riparian polygon will be divided into sampling units by offset transects. Samples will be randomly placed along the offset transect.



Each transect will be a single observation. Woody plant cover will be measured using line intercept measurements. Groundcover will be estimated using the mean of three nested 1 m3 quadrats, each placed randomly within each third of the transect (Figure B-2).

Figure B-2 – Sample Design – Each transect is a single observation. Woody species cover will be estimated using line intercept. Groundcover will be estimated using mean visual estimates from three nested quadrats.



Woody, native, and 'invasive' taxa will be identified to species. Exotic herbaceous species will be identified as either forb or graminoid. Those taxa determined to be 'invasive' will be identified on a site by site basis depending on management concern. For groundcover samples, 0.5 m by 2 m plots will be used. Non plant cover will be classified as large wood, litter, moss, or soil. Quadrats should be subdivided into a 0.25 m grid with each grid square equal to 12.5% for the purpose of increasing replicability and accuracy of cover estimates.

Pilot sampling should be conducted to determine transect length and sample size. Transect length will be optimized to overcome patchiness of vegetation. A length-species curve and

length-variance curve will be used with an exploratory sample to determine optimal Transect length. Exploratory samples will be supplemented by additional samples to improve the mean.

If species cover data deviates substantially from a normal distribution, bootstrap-type resampling analysis will be used to provide a confidence interval estimate for each taxa. Groundcover plot data may be averaged by transect or considered independent samples for analysis.